

Claims

What is claimed is:

1. A battery pack apparatus comprising:

a battery pack including a plurality of rechargeable
5 batteries arranged in parallel, the rechargeable batteries
having cooling medium passages formed therebetween; and

a cross flow fan disposed with an intake chamber facing a
distribution space formed adjacent to one side face of the
battery pack to supply or discharge a cooling medium to each
10 of the cooling medium passages, the fan having an impeller
disposed such that a rotational axis thereof follows an
aligning direction of the rechargeable batteries, wherein

an axial position of the fan is eccentric with respect to
a center line of the distribution space perpendicular to the
15 aligning direction of the rechargeable batteries in a
direction of movement of the impeller at the distribution
space side.

2. A battery pack apparatus comprising:

a battery pack including a plurality of rechargeable
20 batteries arranged in parallel, the rechargeable batteries
having cooling medium passages formed therebetween; and

a cross flow fan disposed with an intake chamber facing a
distribution space formed adjacent to one side face of the
battery pack to supply or discharge a cooling medium to each
25 of the cooling medium passages, the fan having an impeller

disposed such that a rotational axis thereof follows an aligning direction of the rechargeable batteries, wherein

a length of a stabilizer of the fan is from 1.5 to 5 times the size of a gap between an extremity of the stabilizer and the outer circumference of the impeller, and an intake chamber wall doubles as an air discharge passage wall or is adjacent to an air discharge passage wall.

3. A battery pack apparatus comprising:

a battery pack including a plurality of rechargeable batteries arranged in parallel, the rechargeable batteries having cooling medium passages formed therebetween; and

a cross flow fan disposed with an intake chamber facing a distribution space formed adjacent to one side face of the battery pack to supply or discharge a cooling medium to each of the cooling medium passages, the fan having an impeller disposed such that a rotational axis thereof follows an aligning direction of the rechargeable batteries, wherein

an axial position of the fan is eccentric with respect to a center line of the distribution space perpendicular to the aligning direction of the rechargeable batteries in a direction of movement of the impeller at the distribution space side, and

a length of a stabilizer of the fan is from 1.5 to 5 times the size of a gap between an extremity of the stabilizer and the outer circumference of the impeller, and an intake

chamber wall doubles as an air discharge passage wall or is adjacent to an air discharge passage wall.

4. The battery pack apparatus according to claim 1 or 3, wherein

5 an eccentricity amount x of the axis of the fan with respect to a diameter D of the impeller is set to satisfy $0 < x < 1.0D$.

5. The battery pack apparatus according to claim 1 or 3, wherein

10 an eccentricity amount x of the axis of the fan with respect to a diameter D of the impeller is set to satisfy $0.2D < x < 0.5D$.

6. The battery pack apparatus according to any one of claims 1 to 3, wherein

15 the battery pack apparatus is configured to satisfy $F \geq L/2$ where L is a length of the battery pack in the aligning direction of the rechargeable batteries and F is a length in the axial direction of the impeller.

7. The battery pack apparatus according to any one of
20 claims 1 to 3, wherein

the axis of the fan is disposed to be perpendicular with respect to the cooling medium passages.

8. The battery pack apparatus according to any one of claims 1 to 3, wherein

25 the fan is disposed so as to satisfy $y < L/n$ where y is a

displacement amount of the center of the impeller in the axial direction with respect to the center of the battery pack in the aligning direction of the rechargeable batteries, L is a length of the battery pack in the aligning direction of the
5 rechargeable batteries, and n is the number of the rechargeable batteries of the battery pack.

9. The battery pack apparatus according to any one of claims 1 to 3, wherein

the fan is disposed such that positions of junctures of
10 vanes of the impeller in the axial direction are offset from positions opposite to the cooling medium passages.